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Two steps forward one step back: renewable energy transitions in Bulgaria and Romania

Abstract: This paper examines renewable energy policy in Bulgaria and Romania between 2007 and 2017 and explains the reasons behind the unexpected rapid growth in renewables and the dramatic policy reversal that followed. Whilst we find strong formal compliance with EU legislation regarding targets for renewable energy, an examination of institutional change and policy dismantling in both countries finds that this was not supported by a paradigmatic policy change or an accompanying transformation of the energy system. Veto players, including powerful state actors, worked to dismantle renewable energy policy once targets were reached. Our article explores how insights from the intersection of socio-technical systems and historical institutionalist literatures can contribute to explaining policy dismantling in the energy sector. In doing so, we develop a socio-technical account of renewable policy in Romania and Bulgaria. We show that this is related to the historically conditioned, path dependent processes of institutional change where energy materiality shapes the parameters of political possibility and the costs of policy implementation.

Keywords: Renewable energy, path-dependence, power, energy transitions, veto players, socio-technical systems

Word count: 8, 895

Introduction

For Bulgaria and Romania, EU accession in 2007 has been accompanied by limited energy transitions which have challenged domestic power relations. Whilst both countries

met and exceeded their 2020 EU renewable targets by 2013, the period 2011 to 2017 has been characterised by policy dismantling. This covers, for example, the removal or reduction in policy incentives, the lack of implementation and enforcement of legislation, and/or retrospective changes to legislation. The research question we address is why initial (over)compliance was followed by a reversal, exposing a limited renewable energy transition? We examine the dynamics, drivers and barriers to change within the renewables sector in Bulgaria and Romania. The overall picture is one of early 'boom' but shallow compliance, followed by a 'bust' period. This raises questions regarding future compliance with the EU's non-binding (at the national level) 2030 renewable targets, providing insights into barriers to climate and energy policy development. A similar pattern of renewable energy policy over-compliance and then reversal has also been seen in Spain and the Czech Republic (Lockwood et al., 2017). We argue that to explain the pace and extent of policy change it is necessary to look at the underlying socio-technical and institutional factors.

Section I outlines a framework for understanding key mechanisms of renewable energy transitions, emphasising the significance of the 'material' aspect of energy policy and situating the research as a contribution primarily to the state of the art literature combining insights from historical institutionalist (HI) and socio-technical systems literature (STS) (Geels et al., 2016; Kuzemko et al., 2016; Lockwood et al., 2017). The empirical cases are analysed in section II, considering change in the renewable sectors of Bulgaria and Romania and focusing on explaining limits of these energy transitions.

This paper engages with recent developments in STS and HI literature, demonstrating

the value of this approach in explaining the challenges to a more substantive, paradigmatic energy policy shift. The central concepts applied are those related to power, veto players, co-evolution, path-dependence and the layering of rules. We also examine the costs of renewables transition in Bulgaria and Romania and how they relate to these concepts. We find that there has been no displacement of one energy regime by another. Instead there was a period of accommodation by energy regimes with the temporary layering of new rules transposed from the EU. This ceased as veto players aligned to resist a more substantive change in institutional rules, with fewer actors mobilised in support of an energy transition.

We conclude that the EU Renewables Directives has failed to trigger changes in the beliefs of key domestic actors and to build domestic support coalitions, despite early compliance. This is in significant part explained by the technical constraint of the electricity system – namely grid capacity - and its alignment with powerful incumbent veto players. A more substantive renewables transition, would require a series of coordinated changes to break the systemness of electricity[1] (the intrinsic alignment between system components and overall system performance) carried out by supportive domestic coalitions. Instead we find active policy dismantling (Bauer and Knill, 2014) driven by increasing costs of policy implementation beyond the minimum required by the EU, in countries with high rates of energy poverty, particularly Bulgaria, where there is political pressure to minimise the cost to consumers. Policy incentives were removed once policy goals had been achieved, as major

[1] System, here used in a socio-technical sense: social networks and institutions involved in technological development. System components: distribution and transmission grids. System performance: outputs such as security of supply. Systemness: security of supply cannot be achieved without alignment between electricity transmission and distribution.

energy actors began to act as veto players when costs to key energy actors and consumers became apparent and renewable installations significantly exceeded government predictions of a steady progression towards meeting targets in 2020. These costs were directly linked to the materiality of this policy area, the requirement for a substantial upgrade of the electricity grid as well as unintended consequences of policy implementation and the effect of subsidies on industry and residential consumers.

I. Understanding the mechanisms of energy transitions: policy change and path-dependence

This section discusses the mechanisms of energy transitions assumed by the socio-technical systems (STS) and historical institutionalism (HI) literature, and also the work on the extent and durability of such change. Knill and Lehmkuhl (1999: 2-3) identified three mechanisms of EU adaptational pressure on member states: 1) the prescription of 'an institutional model'; 2) altering 'the opportunity structure and domestic actor constellations' and; 3) also (over time) changing beliefs and expectations of domestic actors to rally support for EU policies. Superficial policy alignment can occur, with policies incompletely implemented, and where institutions may reflect EU institutions structurally but not in spirit, and patterns of 'institutionalisation for reversibility' can be spotted (Goetz, 2005: 262). Here EU policies are incorporated into national programs and domestic structures, without substantially modifying existing processes, policies, and institutions (Radaelli, 2003). Although member states were necessarily compliant in transposing EU directives to qualify

for accession (Spendzharova and Versluis, 2013), this can be followed by policy implementation failures (Falkner and Treib, 2008) and (non)compliance (Treib, 2014).

It is the extent of compliance with EU Directives that we investigate, focusing on renewable energy transitions. HI explores institutional change, and tends to assume a high degree of stability. Other research in the field has stressed the gradual, incremental nature of change of institutional rules (Mahoney and Thelen, 2010). Focusing on endogenous sources of change and the assumption of path-dependence and institutional barriers to/catalysts for this, the importance of adequate administrative capacity has been highlighted (Dimitrova and Buzogány, 2014: 141; Treib, 2014: 11), both in terms of institutions and processes for adaptation and compliance beyond 'dead letters' (Falkner and Treib, 2008). Applied to EU accession, administrative capacity or 'institution-building' has been defined as the creation of institutions necessary for the adoption and implementation of the *acquis communautaire*[2] (Dimitrova, 2002). The literature on public policy more generally distinguishes between policy capacity as the 'ability to make intelligent choices and set strategic agendas that optimally use resources' and administrative capacity as the 'ability to manage and implement policy choices' (Bevir, 2009: 41). This distinction is useful for highlighting difficulties at the policy formulation stage linked to policy capacity, particularly the inability of policy-makers to make strategic decisions in the case of renewable promotion schemes, regardless of the policy instruments used.[3] We explore how limited administrative capacity also undermined the ability to then manage and implement renewable policies. Over-production and

[2] Obligations including legislation.
[3] Feed-in-tariffs in Bulgaria and green certificates (GCs) in Romania.

intermittent generation were not anticipated and there was no attempt to match this with investments in grid capacity or inter-connectors.

We apply the concept of path-dependence to energy transitions. This concept is central to both HI (Pierson, 2000) and STS literature (Unruh, 2000; Smith et al., 2005). The latter focuses on the material dimension and the former on the political and institutional. We understand path- dependence as a set of mechanisms through which (often stable) relationships between material (i.e. infrastructure, technology) and non-material elements (such as rules, social conventions and beliefs), influence policy change or continuity. Firstly, Thelen (1999: 388-396) emphasises that path-dependence is a dynamic phenomenon: gradual change occurs, while stability has to be actively (re)produced by political actors, particularly where they seek to avoid increased costs. Where costs increase, actors use their power positions to change the rules of the game to preserve their privileged status quo position (North, 1990).

Path-dependence assumes that coordination effects, positive feedback and alignments amplify existing power asymmetries (Pierson, 2004), contributing to the self-reinforcement or reproduction of policy and development pathways (Arthur, 1994). As a result, processes undermining the status quo are often exogenous (such as EU policy), whereas reinforcement processes are endogenous (such as alignments between actors, and between material and non-material elements). HI assumes that exogenous shocks are capable of stimulating major change, potentially leading to critical junctures in path-dependent institutional structures. In the absence of such shocks, failure to diverge from the status quo can be explained by the role of pre-existing institutions in structuring political outcomes and resisting institutional change

(Thelen and Steinmo, 1992), reinforcing established patterns of interests and routines (Immergut, 2006).

Secondly, we consider co-evolution – the interaction between technology, industry structure and policy institutions (Geels, 2005) – resulting in interest alignment between these actors and the simultaneous development of key processes involving them (Raven and Johnson 1986). This is characteristic of network technologies like energy systems (Katz and Shapiro 1986; Unruh, 2000). Coordination is driven by the adaptive expectations between actors in the system (Rixen and Viola, 2009). Rohracher and Späth frame this as a mutual dependency borne out of co-evolution, between "energy technologies, institutional arrangements (for example, regulation, norms), social practices and actor constellations (such as user–producer relations and interactions, intermediary organisations, public authorities, etc.)" (2014: 1417). More specifically, in the energy sector high upfront investment is required in large-scale centralised electricity generating power plants and the associated distribution and transmission infrastructure, the development of a system designed to distribute electricity generated by large scale energy plants (Unruh, 2002). Regulatory patterns are established in conjunction with a given technology. Energy systems have co-evolved between this electricity generation, the networks to distribute it, and the institutional networks of actors governing and regulating them. This co-evolution is associated with decreasing costs; here a mutual dependency between the components of the electricity system can deepen through self-reinforcement, the positive feedback of increasing returns emerging from such coordination effects as interaction intensifies and consolidates, as the system expands along a specific path (Arthur, 1994).

We contribute to the developing literature that combines insights from HI and STS (including Geels et al., 2016; Kuzemko et al., 2016; Lockwood et al., 2017), by highlighting the interaction of the energy system, institutional arrangements and key actors in the politics of energy transitions, and where, when and why these have acted as veto players. Combining these produces a socio-technical understanding of change (or lack of). The electricity sector has a high degree of systemness, and change to one of its elements - in this case increased intermittent electricity generation due to more installed renewable capacity- requires change and adaptation of other material elements, such as electricity transmission and distribution (van der Vleuten, 2004). Markard (2011) argues that durable and capital-intensive elements generate inertia and obstruct change. In other words, the systemness of energy can create powerful socio-technical inertia, which manifests as rigidity in social and material structures (i.e. the strong persistence of existing form and function); functioning as a barrier to technological change and transition (Rumelt, 1995: 103). Related powerful veto players can lead to policy reversal and the loss of momentum for change. This path-dependence can obstruct the breakthrough of new technologies like wind and solar because of the alignment of regulation, infrastructure, and user practices with pre-existing technology (Lockwood et al., 2017).

Socio-technical regimes (such as electricity generation and use) describe the relatively stable configuration of technical and social elements; a) a network of actors (here, electricity system operators, energy companies, regulators, relevant government ministries and large industrial users); b) a set of formal, normative and cognitive rules guiding actors' activities of (laws and regulations, belief systems, guiding principles, and behavioural

norms); and c) technology and infrastructure (in this case electricity networks, generation facilities, etc.) (Geels, 2005). Stabilising mechanisms can cause lock-in (Unruh, 2000). These include the vested interests of incumbent actors ('regime resistance'), the 'organisational capital' of social networks; and the cost of sunk investments and technical complementarities between components in infrastructures (Geels, 2014).

There is recognition that the STS literature needs to focus more on political struggles (Geels et al., 2016), and to 'make the social and political contextual factors with respect to the choice and implementation of a technology path more explicit' (Schubert et al., 2015: 44). As Kuzemko et al. note (2016), STS literature tends to treat energy governance as a depoliticised process rather than one that takes place in the context of power relations between key groups, and their influence on policy making and implementation. These actors include policy-makers, regulators, energy companies and distribution and transmission operators. Mahoney and Thelen (2010) argue that the stronger the veto possibilities of those defending the status quo the less likely there will be major institutional change, while Smith et al. (2005) find that large incumbents are more influential in more centralised energy systems. Whilst undergoing formal liberalisation, energy regimes in both Romania and Bulgaria remain characterised by high levels of state intervention, and close links between energy companies, regulators and the government (Hiteva and Maltby, 2014).

Transitioning to a low carbon energy system requires an investment in the electricity network to connect a decentralised diffuse network of renewable energy sources, new upfront investment in this electricity generation, and the short to medium compensation to the incumbent electricity generators providing backup to the intermittent renewable electricity

generation. In contrast, the expansion of large scale fossil fuel power plants requires a more limited and less costly expansion and renewal of existing material aspects of the energy system, and no rearrangement of the institutional constellation of actors, norms and rules (Unruh, 2000: 822). This speaks to action/intention, and veto players deeply embedded in (and dependent on) the existing forms and functions (Tsebelis, 2002: 19). Lockwood et al. (2017: 322) point to the fact that 'institutions can change in ways which, while path contingent on existing arrangements, are not completely bound by them and which can also accommodate path creation'. However, whilst an exogenous or endogenous shock to a regime can lead to significant discontinuities in the actors, networks and institutions involved in the regime (Smith et al., 2005), this is not necessarily associated with new path creation. Mahoney and Thelen's (2010) argue that change can take the form of 'displacement' of existing rules or 'layering' alongside them, depending on the absence or presence of veto possibilities, with earlier work suggesting a process of conversion whereby institutions change to serve a new purpose (Streeck and Thelen, 2005).

Our research addresses the following research questions: 1) to what extent did material, and 2) institutional factors, undermine a more substantive renewable energy transition? We argue that there has been a layering rather than displacement of new rules in the energy regimes of Bulgaria and Romania.

II. Case selection

The joint analysis of Bulgaria and Romania follows their parallel pre-accession processes of economic, social and political change, and the striking – if partial - similarities

in the introduction of renewables in both countries post-accession. These two country cases have been selected based on the common socio–technical post-communist legacies which underpin their energy transitions and path-dependencies, and how these interact with EU policies. Bulgaria and Romania share a number of background conditions related to political and economic transition and EU accession. Bojkov (2004: 510) treats them as 'a micro-region of their own', as do a number of other authors linking this to EU accession timing (Levitz and Pop-Eleches, 2010; Noutcheva, G., and Bechev, 2008). These background dimensions also include specific historic, cultural and technical legacies related to their energy sectors, including the transition from central planning to market economies in the early 1990s (Ahrens 2012), high fossil fuel dependency (Eurostat, 2017b),[4] high levels of political capture by incumbent institutions (Hiteva and Maltby 2014), lack of investment in their electricity grids (Hiteva 2013a,b), and high levels of inward foreign direct investment (Kalotay 2008).

Both countries underwent significant changes to their energy policy, including sector restructuring following liberalisation and the introduction of the 2020 renewable targets. However, both were characterised by path-dependence, and tight co-evolution between policy institutions, technologies and industry structures, where the state retains a strong role in both energy sectors and supposedly private and independent energy institutions, like the regulators and energy transmission companies, aligned to protect the interest of state-owned companies.

Given this context, we consider why (over)compliance with renewable targets was achieved early, against expectations, and why policy dismantling followed. Bulgaria and Romania are illustrative rather than representative cases of EU driven renewable policies.

[4] Fossil fuels in final energy consumption: Romania, 63%; Bulgaria, 53% (Eurostat, 2017b).

This interpretive (Lijphart, 1971: 691) or disciplined-configurative (Eckstein, 1975: 99–104) approach is utilised to develop a nuanced understanding of the processes involved in challenging institutional logics and policy dismantling.

Furthermore, a more detailed investigation of Bulgaria and Romania can partially address a gap in the literature. When credible incentive systems are put in place, the adoption of policies from the EU level, and the targets associated with these, end up driving further liberalisation and a surge in investment in the energy sector, leading to (over)compliance. However, we show how this clashes with post-communist legacies and the materiality of the grid and reinforces cleavages between winners and losers, incumbents and newcomers in the transition process, limiting change. This is particularly important as the mechanisms for reaching Renewable Directive targets have changed from binding at the national level for 2020 to binding at the EU level for 2030. This analysis sheds light on the effectiveness of existing governance mechanisms for the promotion of renewables and the material constraints of energy policy.

This paper uses a combination of primary and secondary data. Eleven semi-structured elite energy sector interviews were conducted between 2011 and 2016, and this data is triangulated with other secondary and primary data, including industry and media reports, and policy and legislative documents.

III. Renewables development in Bulgaria and Romania

Adjusting to EU membership and the appearance of radical energy system change

The 2001 and 2003 EU Renewables Directives were swiftly transposed and national strategies included basic provisions for renewables support (Bulgarian Government, 2017; ANRE, 2017). However, renewables growth was limited, as technology prices were high and there was both a lack of state support and little private investment pre-accession (interviews 1, 2, 6, 7). Renewable energy was almost completely restricted to large hydro power plants and in 2007 neither Bulgaria nor Romania had a solar or wind industry (Eurostat, 2017a). Initial policy instruments failed to stimulate investment– in Bulgaria feed-in-tariffs (FiTs) and long-term contracts (12 years) were used, with obligatory, priority and zero cost connection to the electricity grid (Bulgarian Government, 2017). In Romania, Green Certificates (GCs)[5] were introduced in 2005 (ANRE, 2017). The EU's 2009 Renewables Directive (2009/28/EC) introduced binding national targets for 2020, of 24% and 16% of final energy consumption from renewables for Romania and Bulgaria respectively. In anticipation of transposition, the Romanian government passed a law (220/2008) which differentiated GCs by technology type in an attempt to stimulate non large-hydro renewables. The GCs' value was increased, and mandatory annual quotas of green energy and priority access to the electricity grid introduced (ANRE, 2017). A 2008 amendment in Bulgaria extended solar and wind contracts to 15 years (Bulgarian Government, 2017) in a similar attempt to stimulate investment.

This successfully sent a signal to investors of government commitment and EU

[5] A tradable commodity based on 1MWh of renewable electricity.

backing (interviews 1 and 7) and Bulgaria and Romania[6] met their mandatory 2020 renewables targets by the end of 2012 and 2013 respectively (Eurostat, 2017a). Measured against EU renewable targets, both Bulgaria and Romania were clear success stories. However, the headline figures obscured deeper problems. Increasing resistance by incumbent veto players, a new and weak coalition of civil society and renewable producers opposing them, and the end of EU pressure contributed to the Bulgarian and Romanian governments' policy dismantling.

The institutional barriers to renewable energy transition:

Despite EU driven liberalisation, energy regimes in both countries are characterised by a strong role for the state and a tight alliance between the regulator and incumbent energy companies, both public and private. In Bulgaria, for example, regulation of the electricity sector responded to the needs of large energy producers and transmission technology (i.e. the grid). The system for allocation of new capacities was not designed to balance between public and private interests, as the regulators, energy companies and the material infrastructure had co-evolved with 'largely non-existent' private involvement in the energy sector, and in energy systems dominated by large vertically integrated state companies with monopolies in generation, transmission and distribution (Commission 1997a: 32; 79). In Romania for example, the state-owned transmission and system operator (Transelectrica) indirectly administers the centralised competitive wholesale markets (including the GC market) (Gatej, 2016). In both countries, formal independence of regulators and state

[6] Within 0.1% of the target.

companies has been undermined by a lack of political, financial and technical autonomy (Hiteva and Maltby, 2014). Co-evolution inhibited state and administrative capacity.

Both policy-making and implementation have been undermined by a circulation of a small number of energy elites in both countries between the regulators, Energy Ministries, energy companies and the Transmission and Distribution System Operators. In Bulgaria for example, high ranking Energy Ministry staff tend to have jobs on the boards of the state companies that focus on large scale fossil fuel (and nuclear) electricity generation, leading to conflicts of interest and informal channels of influence between ostensibly independent actors within the energy system (Maltby, 2015: 821). In Romania, the Ministry of Energy as key shareholder of Electrica can, and has, forced mid-mandate elections for board members, to suit new political configurations in coalition governments (Pirvoiu, 2017).

Pre-accession, the Commission highlighted shortcomings in Bulgaria; 'insufficient' policy capacity to develop regulation, and limited administrative capacity to 'implement this regulation in practice' (Commission, 1997: 61). Policy capacity in Romania was also limited, with 'strategic planning and analysis…a particular weakness' (Commission, 1997b). Post-accession this post-communist legacy remained. A closed, hierarchical policy-making process undermined improvements (Noutcheva and Bechev, 2008: 128), and a 'passive and patronage-based public administration' continued (Andreev, 2009: 388). Maltby (2015: 820-821) pointed to weakness of administrative capacity in Bulgaria in terms of resources devoted to analysis and costing, a lack of transparent policy making, excessive politicisation of Ministries, uncompetitive pay relative to EU institutions and the private sector leading to problems of recruitment and retention. In 2013 the Commission concluded that there was

'serious understaffing' in the Bulgarian Energy Ministry (European Commission, 2013: 8), whilst in Romania, it took until 2012 to set up an under-resourced department for Energy within the Ministry of Economy, staffed mainly with fossil fuel specialists (interviews 6 and 7; Grosu, 2013). A small Energy Ministry was eventually set up only in March 2014 (InvesTenergy, 2017), by which time the renewables support scheme was already being dismantled through repeated amendments. Evident in both cases was the lack of effective policy and regulatory capacity, to plan for, and/or anticipate the effects of, renewable policy implementation.

In Bulgaria, the state-run National Energy Company (NEC) and private electricity distribution companies (EDCs) became responsible for connecting ever growing renewable capacity to the national grid (Hiteva, 2013a; 2017). There were two key problems with this institutional configuration. Firstly, problems with policy capacity were apparent in the text of the laws; substantial incentives were not matched with analysis regarding the consequences of implementation (Hiteva and Maltby, 2017). Secondly, this was coupled with administrative capacity problems. The central institutions lacked the staff expertise and level of coordination necessary for the oversight of how many renewable projects were being planned and built, and planning of the system's technical upgrading. There was little oversight of the sector or effective strategic planning, and insufficient regulation of electricity grid connections (Hiteva, 2013b). There was a strong persistence of existing form and function that characterises path-dependence. For example, in 2011 the government submitted a Renewables Action Plan to the European Commission, setting out the objective of meeting its target for solar installations in 2020 (Bulgarian Government, 2017). This was a dramatic

underestimate, and within a year this target had been reached (Eurostat, 2017a).

Secondly, incumbent energy actors began to emerge as veto players. Bulgaria's electricity market structure and close alignment between regulator and regulated, allowed the NEC to delay and later refuse[7] to implement national law and connect new renewables and for this to remain hidden from investors and the public (Hiteva, 2013b) and unpunished by the regulator EWRC (interview 9). Instead of protecting stranded renewables, the regulator and policy makers aligned to protect the NEC's interests. As applications for new connections were made to the EDCs and not the NEC, the latter's role in refusing connection of new capacities remained largely hidden from the public eye, leading to national protests against the EDCs in 2012 and 2013 (Hiteva, 2013a, b; 2017). Because of its close alignment with policy makers and the regulators, the NEC exercised a form of technical veto to more renewable capacity and changes in the energy system.

In Romania, the Ministry of Economy and Transelectrica initially acted as veto players, delaying implementation of the 2008 renewables law, shifting the blame to Brussels, as they were waiting for EU approval of the incentive scheme until 2011 (Davidescu, 2017). At the policy formulation stage, the Ministry of Economy did not take into account the financial implications or technical requirements of the policy instruments selected, despite some early warnings (Transelectrica, 2008; interview 11), while later the new Energy Ministry did not consider the effects of frequent amendments to the legislation, making it difficult for distributors to set costs (Tudorache, 2016).

The systemness and path-dependency of the electricity grid meant that technical grid

[7] Due to the threat to its profitability.

capacity was not able to accommodate the extremely rapid, unplanned growth in decentralised wind and solar electricity generation, fueled by the 'expectation of compliance' with binding national renewable targets. National Renewable Energy Plans submitted to the Commission included indicative trajectories which anticipated gradual growth until targets were eventually met *in* 2020, rather than seven to eight years early (Romanian Government 2010; Bulgarian Government, 2011). Lack of administrative capacity meant that policy makers lacked realistic and strategic understanding of what steps needed to be taken, and when. Key veto players such as national grid operators and large industrial consumers emerged as the practical effects of the support schemes (Cartel Alfa, 2014) – including price increases and the significant increase in variable renewables (solar and wind) – became apparent (Everett and Boyle, 2012). Balancing the growing demand for and available grid capacity was left to the national transmission companies in both countries (Hiteva, 2017). The lack of policy and administrative capacity undermined the ability to either forecast or react quickly to high demand and an unanticipated decrease in technology costs. As a result, government subsidies were considerably higher than anticipated.

The response from both governments was to change the support schemes through the withdrawal of incentives. These were rapid rather than phased changes, and in Bulgaria the share of renewables actually decreased. There was a lack of civil society support for renewables beyond a few environmental NGOs (interviews 3, 4 and 5), and a young renewables association and wind industry lobby group which lacked influence (interviews 1, 2, 6 and 7). The renewables industry was also divided internally in Romania between first generation foreign investors and second generation smaller domestic companies (Popa,

2015).

The material barriers to renewable energy transition and unanticipated costs

Although legally binding EU targets led to national adaptation and legislative transposition, there was no corresponding change to the electricity grid. Continuous grid connection of renewables required systemic changes involving network expansion and upgrades. This would have incurred substantial costs to incumbent actors, including accommodating a more decentralised generation of electricity, developing storage flexibility and off-peak demand management (Everett and Boyle, 2012: 493). For Bulgaria and Romania this constituted a systemic and technical barrier to energy transition. In material terms the socio-technical inertia meant that the electricity transmission system lacked the necessary technical capacity to accommodate a rapid increase in intermittent renewable sources (European Commission, 2013: 27; interview 9). The new policies associated with the EU's 2009 renewables Directive created negative political feedback effects (Beland, 2010), as they required complementary organisational and institutional structures, for example investment in developing bi-directional transmission and distribution networks. The interconnected rigidity in social structures led to struggles between key actors and the emergence of strong veto players.

In 2011 the Bulgarian Energy Strategy recognised 'unduly high public costs', prompted the Bulgarian Parliament to adopt a new Energy Act the same year (Bulgarian Government, 2017). The regulator (EWRC), the Electricity System Operator (ESO), the NEC and the Parliament were from this point aligned as active veto players. They enacted and

enforced retroactive measures in order to protect the form and function of the incumbent electricity regime (interview 10). Although formally independent, the regulator and ESO both had strong linkages with the NEC and acted in alignment with its interest, while the ESO and NEC shared staff, databases and offices (Hiteva, 2013b). To address increasing costs, from 2011 the NEC increasingly curtailed renewable generation. The regulator introduced a temporary tax on renewables producers in 2012, followed by a freeze on all connections from 2013 and a tax on renewable electricity revenues in February 2014 (EWRC, 2015). Several amendments to national legislation were made, reducing policy intensity through cuts in the contract length of the FiTs, with the objective of cooling the market (interview 10).

The strong rigidity of function and form was visible early on and manifested in slow and labored implementation of the EU renewables legislation. A 2012 infringement decision for example criticised the Bulgarian government for delays in implementation and establishing a regulatory framework, and the failure to improve the grid access for renewable electricity (European Commission, 2012). The regulator stopped approving new renewable projects in March 2013. Initially a temporary measure until June 2013, this was then extended to 2015 (EWRC, 2015). The political pressure to avoid increasing electricity prices in Bulgaria is significant. Whilst they have long been the lowest in the EU (Eurostat, 2017)[8] in purchasing power standards they are mid-ranking and energy poverty is a major problem, acknowledged by the government in the 2011 Energy Strategy (Bulgarian Government, 2011). The EU estimated that in 2012 47% of the population of Bulgaria was unable to keep

[8] 52% of the EU average in the second half of 2007 and 53% six years later (Eurostat, 2017). Following price rises they had increased to 59% of the EU average in 2016 (still the lowest), and with taxes and levies the second lowest (Eurostat, 2017).

their home 'adequately warm due to financial restrictions' (Eurostat, 2014). No price rises were approved by the regulator between June 2012 and July 2014. Despite this the perception that energy bills were increasing, due to a change in billing, played a role in 2013 street protests that led to the fall of the government, with the next government cutting prices twice in 14 months in office (Reuters, 2014).[9] The combination of growing costs associated with renewable subsidies and grid upgrades and the failure to pass these on to consumers contributed to the NEC's debts reaching €1.5bn in 2014. These pressures, of high energy poverty and NEC's growing deficit, contributed to the drastic cuts to renewable energy support. By March 2014, existing renewable sources were also reduced to 60% of their working capacity due to lack of grid capacity, and grid access fees and a tax on revenues were also introduced between 2014 and 2015 (EWRC, 2015).

Whilst the renewables sector continued to grow in 2013 and 2014, reaching 19% in 2013 (3% over the 2020 target), by 2014 the effect of reversing support mechanisms became clear, with the overall share of energy from renewable sources actually declining to 18% (Eurostat, 2017a). In 2015, the Bulgarian Parliament removed the preferential pricing scheme for any new renewable projects, signaling an end to government support (Reuters, 2015).

Addressing increasing costs in Romania followed a similar strategy. Whilst less prevalent than in Bulgaria, energy poverty is also a problem in Romania, with EU estimates of 15% of the population affected (Eurostat, 2014). In response to rising electricity prices for final consumers and also to grid capacity problems, the majority state-owned EDC

[9] Smilov (2015: 18-19) notes that the 'first targets of popular anger were "the monopolies" (electric power supplier companies)'.

Transelectrica and the Government asked the regulator ANRE in 2012 to limit the quantity of wind energy to only a third approved that year (EWEA, 2013). In 2013, despite an economic slow-down, large industrial consumers were forced to buy GCs because of a set annual quota, prompting the Association of Big Industrial Energy Consumers to mount a sustained campaign against the renewables support scheme, with threats to move their investment abroad from strategic investors such as Mittal (Barbulescu, 2013) alongside protests organised by industry trade unions (Cartel Alfa, 2014). A 2013 Government emergency decision responded to this pressure by suspending some GCs until 2017 (ANRE, 2017), leading to a market freeze in terms of new projects, contracts and loans (interviews 1 and 2; Popa 2015). Between 2011 and 2017 the renewables law was amended eighteen times, first delaying its application, then reducing incentives (lower annual quotas and number of GCs per technology) and exempting some final consumers from the scheme (ANRE, 2017). The decrease in the annual compulsory quota of renewables (from 17% to 12.5%) in 2015 effectively created a large surplus, leading to uncertainty, as it devalued GCs and cut profits for renewables' investors (Popa, 2015). This divided investors into winners and losers. The latter were the second generation domestic and small investors, unable to bear short term losses, facing bankruptcy and pushing for reform and a move to FiTs, while first generation, mainly foreign,[10] investors invoked EU legislation to maintain existing levels of support (interview 11, Popa, 2015).

Major RES investors (such as the Monsson Group and ENEL) started dismantling

[10] For example, CEZ (Czech Republic), Enel (Italy), Energias de Portugal, Iberdrola (Spain), Verbund (Austria), RWE Innogy (Germany).

wind turbines or tried to sell their wind parks (Mailat, 2015). The Energy Ministry recognised the effect of repeated modifications on investor confidence but concluded that there were unacceptably high technical difficulties and costs of integration into the energy system to be borne by the state and consumers (Romanian Government, 2016). The costs of the renewables scheme for consumers were unclear and final bills overestimated (Tudorache, 2016). The initial success was followed by repeated amendments that made the incentive scheme unattractive to investors, distorted the GCs market and led to overcompensation, followed by political and societal backlash against renewables.

IV. Understanding dynamics of change in the post-accession period

Our empirical research supports the claim by Lockwood et al. that 'historical institutionalism is a valuable complement to STS approaches' (2017: 312) when explaining renewable energy transitions. EU pressure has been highly influential in acting as a stimulus for the renewables sectors in Bulgaria and Romania, but our analysis demonstrated that in explaining the lack of a paradigmatic change in renewable energy policy, we need to consider the underlying institutional and material conditions and legacies that contributed to the rapid dismantling of the incentive systems for renewables.

Adaptation pressures stemmed largely from a misfit with domestic policy and the need to comply with EU Directives, with the added benefit of promoting foreign investment. Incentives were predominantly focused on generation but ignored impact on distribution and transmission. On the other hand, powerful disincentives were introduced to incumbent actors

in terms of cost, and threats to the existing form and function of the electricity regime. This lopsided incentive framework failed to challenge the incumbent complementarities between institutional arrangements and infrastructure and technology.

From 2011, policy support mechanisms were removed after 'shallow institutionalisation', an adherence to the minimal legal requirements rather than a substantive renewable energy transition (Goetz 2005: 262). The rapid decrease in policy commitment by government was determined by the limited breadth of governmental intervention in the policy expansion phase, with instruments focused on decreasing financial barriers to renewables production and connection. Support for the wind and solar industries was characterised by mixed signals from government, from initial legislative support to a rapid backtracking and amendments. The rapid change in policy incentives was linked to institutional capacity problems but did not happen by default. In Romania, repeated emergency amendments, by different governments, made future investments unattractive and some existing projects were unable to recover set up costs. This was linked to the path-dependence observed in both cases, and the strong co-evolution between energy technologies, companies and policy institutions in the energy sectors. Renewables developed alongside rather than displacing other forms of electricity generation, without strategic consideration on how the system could accommodate them.

There was adherence to the letter but not spirit of EU legislation. In both countries the state-owned/controlled energy companies, regulators, and policy makers coordinated to maintain the existing socio-technical regime. Independent regulators have been assumed to contribute to policy stability through the creation of institutional veto players that would

establish credible commitment (Lockwood, 2017: 318), through for example the prevention of rapid policy change, retrospective measures and an unfavourable investment climate. However, in Bulgaria and Romania the regulators contributed to this uncertainty and change. From 2011 major incumbent actors acted as influential veto players, a form of regime resistance (Geels, 2014).

The transposition of EU renewable Directives temporarily affected the internal processes of the regime (access and integration to the grid) and led to over-compliance with targets, but not to substantive discontinuities in the groups of actors, networks and institutions, or the level of their influence in the regimes. The adaptation to the EU Directive was a temporary accommodation within, rather than change of, the incumbent regime. It ended when the technical limits of the electricity system challenged the place and profitability of powerful technical actors, and political alliances. The ad hoc and temporary relationships and coordination between key institutions and actors supportive of renewables failed to successfully challenge the high complementarity between the social and technical elements of electricity supply (i.e. its systemness). The adaptational pressure of policy misfit evaporated once mandatory targets had been achieved.

The systemness and path-dependence of the energy system are key to explaining the limits of an energy transition prompted by EU legislation. The material capacity of the electricity grid in both countries is crucial in explaining the preferences of powerful incumbent veto players in the energy sector. Insights from the literature on STS contributes here to an understanding of how technologies, rules, actors and networks interact to (de)stabilise existing arrangements, explaining the persistence of incumbent energy systems

and the drivers and barriers to change.

V. Conclusion

The cases of both Bulgaria and Romania demonstrate that the existing literature can only partially explain the processes of energy renewable energy transition since EU accession in 2007. Our contribution illustrates how the systemness and path-dependence of the energy sector has led to veto players with vested interests opposing a deeper and more substantial change. There has been no significant path creation with a supporting lobby group of political, business and/or societal actors. If we apply Mahoney and Thelen's (2010) framework for characterising institutional change, the cases of Bulgaria and Romania indicate a situation of initial 'layering' of rules and institutional conversion followed by the removal of incentives, with institutions largely reverting to their former role. We find that there was no paradigmatic policy shift in Romania and Bulgaria in terms of the guiding ideas, beliefs and principles (Daigneault: 2014: 456). Defenders of the status quo had strong veto possibilities, exercised to prevent institutional change (Mahoney and Thelen, 2010: 8-9) as the ongoing, exponentially increasing costs became clear.

A key contribution of this paper is in developing a socio-technical account of renewable policy, by considering together the relationship (and linkages) between path-dependence and EU pressure in the processes of change. In the case of renewables this involves considering the role of technology and the materiality of electricity (i.e. transmission and distribution grids) through explaining the processes of path-dependence and co-evolution. Our analysis

demonstrates that policy dismantling was an outcome of endogenous (i.e. increasing returns and self-reinforcement) as well as exogenous (such as EU policy) processes. This approach recognises the extent to which energy is deeply embedded in institutional structures, while subject to high levels of systemness. Power asymmetries emergent from the co-evolution of energy technology, political institutions and energy industry, led to veto players resisting substantive change to the electricity system.

The political economy of renewable energy policy in both Bulgaria and Romania meant that there was an alignment of interests given the state role (historical and contemporary) in policy-making, regulation and implementation. There were actors outside of this strongly state directed dimension, but they were new, fragmented, and weak in the absence of EU support (once targets had been reached). There has been the introduction of new formal rules, and this layering was a result of transposition of EU legislation, with the EU as the change agent. This was temporary and de-layered in response to veto players' defence of the existing regime. Technical and political actors in the energy regime formed deep alignments through co-evolution, resisted displacement of old institutional rules, and instead placed new rules alongside existing ones. This influenced the dismantling of support for renewables.

EU targets and monitoring of member state implementation has contributed to short term compliance, but not substantive change. In considering how to achieve the EU's 2030 targets, what needs to be directly addressed is the materiality of energy - the technical aspect of socio-technical change captured in concepts like systemness, and the capacity of electricity networks and energy actors to cope with the associated costs of change - captured in the

concepts of path-dependence and co-evolution. We find that a lack of positive feedback effects from the policy design in Bulgaria and Romania contributed to a narrow distribution of financial benefits which were primarily captured by large international investors, and the concentration of costs on (majority) state owned entities.

Our contribution highlights the need to look beyond formal transposition and initial policy implementation. The extent of compliance and path creation is crucial, as our research has highlighted that the perception of this is key for private sector investment decisions, and the withdrawal of government support in both countries has had a dramatic effect on investment decisions and confidence, as in the Czech Republic and Spain (Lockwood et al., 2017). A topic for further research is the duration of this effect, and the geographical scope, given that other member states have made similar policy and legislative decisions. The relevance of our cases for other post-communist countries is linked to the fact that insofar as renewables are seen as just a foreign investment opportunity without any changes to the status-quo or the institutional structure, they are not able to contribute to an energy transition. Mechanisms for integrating renewables in the system such as investment in interconnectors, grid capacity, storage and smart grids are a necessary pre-requisite. With the exception of the Baltic states other countries in the region have tended to opt instead for formal implementation and incentive schemes only (European Commission, 2017: 94-95). The lessons from the 'success' of renewables in Romania and Bulgaria are that costs incurred by final consumers and indirectly by political actors are significant in the new member states, where fuel poverty is high and populism on the rise.

The loosely defined EU 2030 renewable targets could contribute to further energy

transition within member states in cases where this follows an endogenous renewal trajectory, an alignment of the interests of incumbent actors like the Bulgarian NEC and Romanian Transelectrica with those of the EU, and the costs to such veto players should be considered. We argue that insights from both HI and STS literatures can better account for the politics of energy transitions and struggles between actors, as; historically conditioned, path-dependent processes where energy materiality shapes the parameters of political possibility and the costs of policy implementation.

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3. NGO president, Bucharest, 25/07/2013.
4. Energy Policy Analyst A, Bucharest, 24/03/2015.
5. Energy Policy Analyst B, Bucharest, 24/03/2015.
6. RES investor, Varna, 08/03/2011.
7. RES investor, Sofia, 09/05/2011.
8. Senior RES transmission expert, Veliko Turnovo, 05/03/2011.
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